Windbreak Planting, McCone County, Montana

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Objective: Windbreak planting
County: McCone, MT
Average Annual Precipitation: 12 - 15 inches
MLRA: 58A, Northern Rolling Plains, Northern Part
Dominant Soil Type: Cambert loam & Alona silt loam
Elevation: 2493 ft
Planting Date: Spring 2004
Planting Method: Conservation District's tree planter
Previous Site History: Crested wheatgrass pasture
Irrigation: None
Grazing: Wildlife browse from deer
Monitoring Dates: 2004, Oct 2005, and June 2019

Fig. 1. Caragana (left) and Rocky Mountain juniper (right) 15 years after planting.

Table 1. Windbreak species planted, spring 2004.

Common Name	Scientific Name	Origin	Material	Row Spacing (feet)	Number Planted
Ponderosa Pine	*Pinus ponderosa*	Native	bareroot	12	160
Rocky Mountain Juniper	*Juniperus scopulorum*	Native	bareroot	9	120
Green Ash	*Fraxinus pennsylvanica*	Native	bareroot	10	100
Caragana	*Caragana arborescens*	Introduced	bareroot	6	150

Introduction:
The objective of this project was to test ponderosa pine, Rocky Mountain juniper, green ash, and caragana for windbreak plantings in eastern Montana (Table 1). These species have the potential to provide protection from wind and soil erosion and are also suited for field borders, living snow fences, wildlife habitat improvements, visual screens, and more.

An important part of establishing a windbreak is protecting the seedlings from existing competitive vegetation. Heavy competition from grass and weed cover will choke out the planting. Sites should be prepared to reduce vegetation competition by either mowing, disking/light tillage, applying a glyphosate treatment, or use these in combination. Use a tree planter in the early spring when bareroot stock is dormant. Following planting, continue to reduce competitive vegetation using between row cultivation or mowing, installing a six-foot-wide weed fabric when planting, or using chemical weed control.

Results:
Fifteen years after planting, Rocky Mountain juniper and caragana were the best performers in this test project. Juniper survival was 79% and caragana survival was 76% (Table 2). Junipers averaged ten feet tall by ten feet wide and had dense branching that provides excellent wind protection. Similarly, caragana was 10 feet wide by 13 feet tall and the six-foot spacing when planting resulted in a dense windrow for wind protection. Rows of juniper and caragana were being used by deer and upland birds.

Ponderosa pine and green ash had approximately 50% survival after 15 years. The ponderosa pine looked drought stressed with browning needles. Even though these two species are native to the region, they may not have been as suited to the site soils or may have benefited from irrigation for better establishment.

Table 2. Species survival and characteristics fifteen years following planting.

Species	Percent Survival	Average Height (feet)	Average Width (feet)	Branch Porosity (space filled by branches)
Ponderosa Pine	54%	20	12	30%
Rocky Mountain Juniper	79%	10	10	95%
Green Ash	46%	15	6	10%
Caragana	76%	10	13	80%

Best Management Practices for Establishing Windbreaks:

- Select species appropriate for the site and soil characteristics.
- Site preparation should control grasses and weeds for 1 to 2 years prior to planting.
- Follow planting and spacing guidelines as described in NRCS Conservation Practices for Windbreak/Shelterbelt Establishment (380) and Windbreak/Shelterbelt Renovation (650).
- Use six-foot-wide, high quality woven weed fabric, on-going cultivation, or chemical treatment to control weeds and competing vegetation.
- Use tree protectors or fencing if herbivory may be an issue.
- Create a maintenance plan that may include irrigation, fertilizer, weed and grass control, mowing, and pruning needs.
- Monitor the windbreak for survival and injury, and replant to reach survival goals.

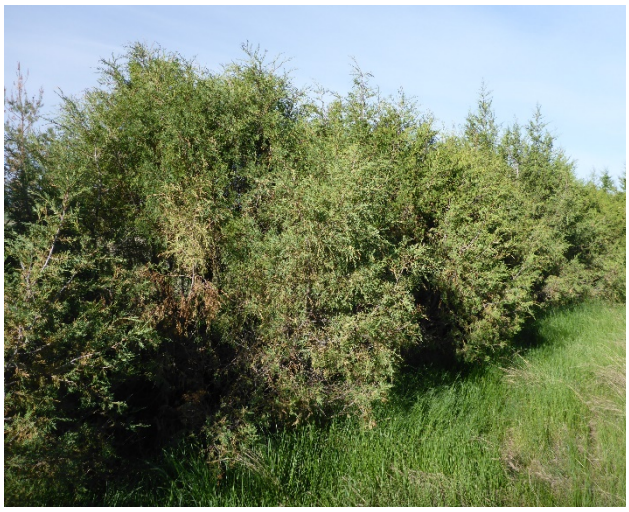

Fig. 2. Rocky Mountain juniper had high survival and formed a dense canopy for wind protection and wildlife use.

Fig. 3. Ponderosa pine and green ash were stressed and may have benefited from irrigation while establishing.